

PATENT *TFW*

Attorney Docket No.: INTEL1340-1 (P14243X)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Su et al. Art Unit: 1637
Application No.: 10/667,776 Examiner: Not Yet Assigned
Filed: September 22, 2003
Title: DETECTING MOLECULAR BINDING BY MONITORING
FEEDBACK CONTROLLED CANTILEVER DEFLECTIONS

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL SHEET

Sir:

Transmitted herewith for the above-identified application please find:

1. Information Disclosure Statement (2 pages);
2. Form PTO 1449 from parent, S/N 10/254,201, filed September 24, 2002 (5 pages);
3. Form PTO 1449 (1 page);
4. Twelve references;
5. International Search Report (7 pages); and
6. Return Receipt Postcard

CERTIFICATION UNDER 37 CFR §1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on September 2, 2004, in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Karen LePari

Karen LePari

In re Application of:

Su et al.

Application No.: 10/667,776

Filed: September 22, 2003

Page 2

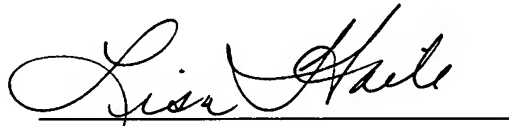
PATENT

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No fee is deemed necessary in connection with the filing of this Information Disclosure Statement. This statement is being filed prior to receipt of a First Office Action on the merits. Also, the items of information contained in this statement cited in a communication from a foreign patent office in a counterpart foreign application, dated July 5, 2004, which is not more than three months prior to the filing of this statement. However, if any fee is required, authorization is hereby given to charge the amount of any such fee, or credit any overpayment, to Deposit Account No. 50-1355.

Respectfully submitted,

Date: September 2, 2004



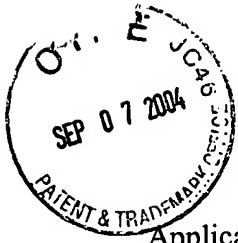
Lisa A. Haile, J.D., Ph.D.

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INFORMATION DISCLOSURE STATEMENT

Sir:

In accordance with 37 C.F.R. § 1.97, enclosed are references relating to the above-identified application. For the convenience of the Examiner, these references are listed on the attached Form PTO-1449 and a copy of each reference, not previously cited in the parent application (S/N 10/254,201, filed September 24, 2040) is enclosed herewith. Additionally, references contained in the information disclosure statement, cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement, are also enclosed.

It is respectfully requested that these references be considered in the examination of this application and their consideration be made of written record in the application file.

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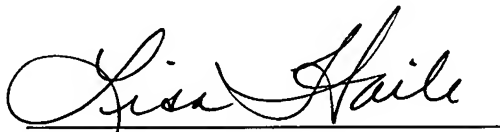
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Substitute for form 1449A/PTO

(modified)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Complete if known

Application Number	10/254,201
Filing Date	September 24, 2002
First Named Inventor	Xing Su, et al.
Group Art Unit	2856
Examiner Name	Not yet assigned
Attorney Docket	42P14243

Sheet 1 of 5

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No. ¹	U.S. Patent Document Number	Kind Code ² (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines Where Relevant Passages or Figures Appear
		5,106,729		Lindsay et al.	04/21/1992	
		5,607,568		Zenharusern et al.	03/04/1997	
		5,866,328		Bensimon et al.	02/02/1999	
		6,033,852		Andle et al.	03/07/2000	
		6,073,484		Miller et al.	06/13/2000	
		6,079,255		Binnig et al.	06/27/2000	
		6,092,422		Binnig et al.	07/25/2000	
		6,123,819		Peeters	09/26/2000	
		6,194,148		Hori et al.	02/27/2001	
		6,280,939		Allen	08/28/2001	
		6,310,189		Fodor et al.	10/30/2001	
		6,325,904		Peeters	12/04/2001	
		6,379,895		Fodor et al.	04/30/2002	

Foreign Patent Documents

Examiner's Initials	Date	Document Number	Country	Class	Sub-Class	Translation
	03/13/1997	WO 97/09584				

Examiner Signature

Date Considered

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard St.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

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				Group Art Unit	2856
				Examiner Name	Not yet assigned
Sheet	2	of	5	Attorney Docket	42P14243

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		ABADAL, et al., "Non-Linear Static and Dynamic Behaviour of an Electrostatically Excited Nanocantilever: Electrical Modelization and AFM Characterization," 9 th MEL-ARI/NID Workshop: 6-8 February 2002, Catania, Italy, 2 pages.	
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		DAVIS, et al., "Nano-Resonators for High Spatial Resolution Mass Detection," Retrieved from the Internet December 13, 2002, http://www.nbi.dk/dfs/abs2000.ff16.html , 1 page.	

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OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

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		FABIAN, et al., "Fabrication of Micromechanical Cantilever Sensors for Nanoscale Thermal Detection," PSI Annual Report 1999, 1 page.	
		FRITZ, et al., "Translating Biomolecular Recognition into Nanomechanics," <i>Science</i> , Vol. 288, April 2000, 2 pages	
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		LANG, et al., "An Electronic Nose Based on a Micromechanical Cantilever Array," Retrieved from the Internet, www.chem.ucla.edu/dept/Faculty/gimzewski/pub/UTAS.pdf , 4 pages.	
		LANG, et al., "Sequential Position Readout from Arrays of Microchemical Cantilever Sensors," <i>Appl. Phys. Lett.</i> , 72(3), January 1998, 383-385.	
		LANG, et al., "An Artificial Nose Based on a Micromechanical Cantilever Array," <i>Analytica Chimica Acta</i> , 393 (1999) 59-65.	
		MEHTA, et al., "Single-Molecule Biomechanics with Optical Methods," <i>Science</i> , Vol. 283, March 1999, 7 pages.	

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		MÜLLER, et al., "Electrostatically Balanced Subnanometer Imaging of Biological Specimens by Atomic Force Microscope," <i>Biophysical Journal</i> , Volume 76, February 1999, 1101-1111.	
		SMITH, et al., "Inexpensive Optical Tweezers for Undergraduate Laboratories," <i>Am. J. Phys.</i> , 67 (1), January 1999, pp. 26-35.	
		TAMAYO, et al., "High-Q Dynamic Force Microscopy in Liquid and Its Application to Living Cells," <i>Biophysical Journal</i> , Volume 81, July 2001, 526-537.	
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		WALKER, et al., "Mechanical Manipulation of Bone and Cartilage Cells with 'Optical Tweezers'," <i>FEBS Letters</i> , 459 (1999) pp. 39-42.	
		WILSON, "A Practical Approach to Vibration Detection and Measurement," Retrieved from the Internet February 4, 2002, http://www.sensormag.com/articles/0299/prac0299/mail.shtml , 19 pages.	
		WU, et al., "Origin of Nanomechanical Cantilever Motion Generated from Biomolecular Interactions," <i>PNAS</i> , Vol. 98, No. 4, February 2001, 1560-1564.	
		Yamaguchi, et al., "Adsorption, Immobilization, and Hybridization of DNA Studied by the Use of Quartz Crystal Oscillators," <i>Anal. Chem.</i> 1993, 65, 1925-1927.	
		Zhou, et al., "Microgravimetric DNA Sensor Based on Quartz Crystal Microbalance: Comparison of Oligonucleotide Immobilization Methods and the Application in Genetic Diagnosis," <i>Biosensors and Bioelectronics</i> , 16 (2001) 85-95.	
		"Single Cell Detection Using Micromechanical Oscillators," Biology and Chemistry, Project # 762-99," Retrieved from the Internet on January 7, 2003, URL://< www.nnf.cornell.edu/2001cnfra/200138.pdf > 2 pages.	
		"Nanomechanical Cantilever Array Sensors," Retrieved from the Internet on January 7, 2003, URL://< http://monet.physik.unibas.ch/nose/inficon > 5 pages.	

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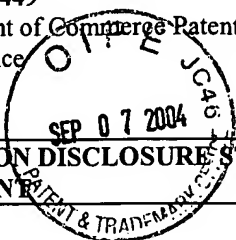
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		"Cantilever Arrays; Biochemical Sensor; DNA Sensor; Mass Sensor; and Measurement Setup," Retrieved from the Internet on January 21, 2002, URL://<http://www.zurich.ibm.com/st/nanoscience/arrays.html> 8 pages.	
		"Thermogravimetry," Retrieved from the Internet on March 8, 2002, URL://<http://www.zurich.ibm.com/st/nanoscience/thermogravimetry.html> 2 pages.	
		"Electrostatic Force-Feedback Force Sensor," Retrieved from the Internet on March 29, 2002, URL://<http://www.ifm.liu.se/Applyphys/spm/instruments/forcefeedback.html> 2 pages.	

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	Applicants: Su et al.	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date: September 22, 2003	Group Art Unit: 1637



U.S. PATENT DOCUMENTS

EXAM. INITIALS		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
	AA	5,739,425	04/14/1998	Binning et al.			
	AB	6,436,647 B1	08/20/2002	Quate et al.			
	AC	2002/0102743 A1	08/01/2002	Majumdar et al.			

FOREIGN PATENT DOCUMENTS

EXAM. INITIALS		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB-CLASS	TRANSLATION (YES/NO)
	AD	WO 00/14539	03/16/2000	PCT			
	AE	WO 00/58729	10/05/2000	PCT			
	AF	WO 01/33226 A1	05/10/2001	PCT			

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages)

	AG	Baselt, David R. et al., "Biosensor based on force microscope technology", <i>J. Vac. Sci. Technol. B.</i> , Vol. 14, No. 2, pp. 789-793, 1996.
	AH	Bloch, Immanuel et al., "Optics with an Atom Laser Beam", <i>The American Physical Society.</i> , Vol. 87, No. 3, pp. 030401-1-030401-4, 2001.
	AI	Dutta, P. et al., "Enantioselective Sensors Based on Antibody-Mediated Nanomechanics", <i>Analytical Chemistry</i> , Vol. 75, No. 10, pp. 2342-2348, 2003.
	AJ	Fritz, J. et al., "Translating Biomolecular Recognition into Nanomechanics", <i>Science</i> , Vol. 288, pp. 316-318, 2000.
	AK	Han, J. and Craighead, H.G., "Separation of Long DNA Molecules in a Microfabricated Entropic Trap Array", <i>Science</i> , Vol. 288, pp. 1026-1029, 2000.
	AL	Guanghua, Wu et al, "Bioassay of prostate-specific antigen (PSA) using microcantilevers", <i>Nature Biotechnology</i> , Vol. 19, pp. 856-860, 2001.

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